RANALLY METRO AREAS

Ranally Metro Areas (RMAs) represent Rand McNally's definition of the developed areas around each important city. RMAs include one or more central cities, satellite communities, and suburbs, but are not restricted to following county boundaries as are MSAs. For this reason, RMAs provide a better portrayal of the extent of urban and suburban development than do MSAs. While the MSA is useful for making general comparisons between major urban centers or for summarizing the importance of a given area for business purposes, the RMA offers a more precise look at areas of concentrated population.

There are two basic criteria which determine inclusion within an RMA. In general, an area must have 1) at least 70 people per square mile and 2) at least 20% of the labor force must commute to the central urban area of the RMA. These requirements provide general guidelines for drawing consistent boundaries for RMAs across the nation.

A comparison of the MSA and the RMA for a single city clearly demonstrates the difference between the two methods of definition and their subsequent uses. For example, the Metropolitan Statistical Area of Charleston, SC includes the entire counties of Berkeley, Charleston, and Dorchester. Relatively large in size, the MSA covers a total of 2,621 square miles. 81% of its population, however, is concentrated in a 478-square-mile area. The corresponding RMA for Charleston, SC encompasses only the 518 square miles of densest population. While the MSA exaggerates the actual extent of Charleston's concentrated marketable area, the RMA defines with more accuracy the area of Charleston's development and economic influence.

RMAs have been defined for all areas with a population of at least 50,000. Selected areas of less than 50,000 are also defined as RMAs because they either have populations close to 50,000, include a central city of an official MSA, or are of special significance to the state. There are now 452 RMAs.

GROUPED WITHIN REGIONS/SIZE CLASSES

Northeast (incl. DE, MD, DC and WV)

	RANALLY METRO AREA			CENTRAL CITY		SUBURBS		LAND AREA (Sq. miles)		
	Population Estimate 12/31/92	Population Census 4/1/1990	Percent Change 1990-92	Population Estimate 12/31/92	Percent Change 1990-92	Population Estimate 12/31/92	Percent Change 1990-92	Metro Area	1992	1990
New York, NY-NJ-CT	17,476,800	17,310,800	1.0	7,659,100	.8	9,817,700	1.1	6,286	333	333
Philadelphia-Trenton-Wilmington, PA-NJ-DE-MD	5,468,900	5,381,900	1.6	1,735,800	-.6	3,734,100	2.7	3,418	154	154
Boston, MA-NH	4,178,500	4,171,900	.2	921,200	-1.0	3,257,300	.5	3,106	132	132
1,000,000 - 2,499,999	8,088,400	7,998,200	1.1	1,638,600	-1.0	6,449,700	1.6	8,177	208	208
500,000 - 999,999	5,418,800	5,307,100	2.1	1,825,400	-.5	3,411,300	1.1	6,506	307	307
300,000 - 499,999	1,776,700	1,775,200	.8	484,000	.5	1,292,700	.7	2,691	94	94
200,000 - 299,999	3,027,400	2,986,600	1.7	908,100	1.3	2,134,300	1.9	5,288	365	365
100,000 - 199,999	1,637,400	1,606,600	1.9	716,900	2.1	920,500	1.8	3,676	283	283
70,000 - 99,999	1,956,800	1,917,800	2.0	680,000	1.5	1,276,800	2.3	5,684	379	377
50,000 - 69,999	1,195,000	1,171,900	.7	476,100	.8	703,900	.6	4,245	276	276
Less than 50,000	267,900	266,400	.5	122,700	4.6	144,900	-2.8	572	88	88
Total in RMAs	50,497,400	49,894,300	1.0	17,271,200	.4	33,136,200	1.4	51,056	2,621	2,617
Not in RMAs	8,861,500	8,763,100	2.1					147,654		
TOTAL, NORTHEAST	59,358,900	58,657,400	1.2					198,709		

Midwest (North Central)

Chicago, IL-IN-WI	8,014,800	7,836,300	2.3	2,808,600	.8	5,206,200	3.1	3,699	227	227
Detroit, MI	4,365,100	4,348,100	.9	1,129,800	-.9	3,259,300	1.5	3,275	165	165
1,000,000 - 2,499,999	13,385,600	12,992,200	3.1	4,388,300	1.2	9,012,300	4.1	13,928	1,286	1,286
500,000 - 999,999	3,787,600	3,680,700	2.1	1,438,700	2.1	2,323,800	2.1	5,539	381	377
300,000 - 499,999	2,818,400	2,566,700	2.0	1,222,300	2.5	1,396,100	1.6	4,548	413	407
200,000 - 299,999	2,162,400	2,121,100	1.9	1,158,600	3.1	1,003,800	.8	3,800	442	432
100,000 - 199,999	3,910,400	3,827,700	2.2	2,159,700	2.1	1,750,700	2.3	7,977	915	904
70,000 - 99,999	2,116,000	2,062,700	2.6	1,283,400	2.9	832,600	2.2	4,623	536	527
50,000 - 69,999	1,309,800	1,294,100	1.2	675,300	1.7	634,500	.7	3,816	295	285
Less than 50,000	681,400	670,800	1.6	486,900	1.5	194,500	1.8	1,417	252	251
Total in RMAs	42,365,400	41,399,400	2.3	16,739,600	1.6	25,615,800	2.8	52,820	4,914	4,860
Not in RMAs	18,484,700	18,269,400	1.0					699,484		
TOTAL, MIDWEST	60,810,100	59,668,800	1.9					752,104		

UNITED STATES DEPARTMENT OF
COMMERCE
NEWS
WASHINGTON, D.C. 20230

BUREAU OF THE CENSUS

Public Information Office
301-763-4040

Robert Speaker
301-763-7962

EMBARGOED UNTIL:
Wed., Dec. 18, 1991
CB91-334

URBAN POPULATION TOPS 75% MARK FOR FIRST TIME, CENSUS BUREAU ANALYSIS OF '90 DATA REVEALS

The nation's urban areas continued to act as population magnets during the 1980s, increasing by 20 million people or 12 percent, according to tabulations from the 1990 census released today by the Commerce Department's Census Bureau.

By 1990, 75.2 percent of the population lived in urban areas, up from 73.7 in 1980, while the proportion of the population living in rural areas fell from 26.3 percent to 24.8 percent.

Numerically from 1980 to 1990, urban dwellers increased from 167.1 million to 187.1 million. In comparison, the rural population rose by only 3.6 percent, or an additional 2.2 million persons, from 59.5 million to 61.7 million.

During the decade of the 1970s, the urban proportion increased by only a tenth of 1 percent--from 73.6 percent in 1970 to 73.7 percent in 1980--the smallest gain in the nation's history. The

(more)

Table 1. POPULATION, HOUSING UNITS, AND LAND AREA BY URBAN AND RURAL: 1970 - 1990

	Population	Housing units	Land area	
			Square kilometers	Square miles
1990				
Total	248,709,873	102,263,678	9,158,960.4	3,536,278.0
Urban	187,053,487	76,212,052	226,304.2	87,375.9
Percent urban	75.2	74.5	2.5	2.5
Rural	61,656,386	26,051,626	8,932,656.1	3,448,901.8
Percent rural	24.8	25.5	97.5	97.5
1980				
Total	226,542,203 *	88,410,629 *	9,166,763.9	3,539,291.1
Urban	167,050,992	64,938,861	191,479.2	73,930.2
Percent urban	73.7	73.5	2.1	2.1
Rural	59,494,813	23,472,402	8,975,284.7	3,465,360.9
Percent rural	26.3	26.5	97.9	97.9
1970				
Total	205,302,037 *	68,220,881 *	9,160,454.5	3,536,855.0
Urban	149,646,629	50,142,681	140,126.8	54,105.0
Percent urban	73.6	73.8	1.5	1.5
Rural	53,565,297	18,536,429	9,020,327.7	3,482,752.0
Percent rural	26.4	27.8	98.5	98.5

* The 1970 and 1980 total population and housing counts have been revised since the 1970 and 1980 publications, respectively. Urban and rural numbers have not been corrected.

Total land area for the United States varies based on updated information and differences in measuring methods.

BERNARD B. BOSSARD

EDUCATION: Virginia Military Institute, BSEE

EMPLOYMENT BACKGROUND:

1990-Present

Partner, CellularVision, Inc.

1977-1990

President, I/TTIC
Designed packet switch and microwave communications network under two contracts totaling over $4,000,000.

Senior Vice President and Group Publisher, Horizon House-Microwave, Inc.
Responsible for the publication of Microwave Journal. The Journal of Electronic Defense, and Telecommunications magazines. These publications had a circulation of 200,000 plus).

1973-1977

Manager, M/A-COM (KMC Division)
Focus on development in research, development and application of new products.
Upon leaving M/A-COM a non-competitive agreement prevented employment in microwave industry for a period of time.

1970-1973

General Manager, KMC Semiconductor Corp.
KMC was the first company to manufacture transistor (above 1 GHz). In addition to transistors, KMC produced tunnel diodes, back diodes, varactors,, solid state amplifiers and small sub-systems. The company was purchased in 1973 by M/A-COM (Microwave Associates) and is now part of their semiconductor operation.
Developed high dynamic range interference reduction circuits and target identification techniques for U.S. government.
Co-developed key Patriot Missile interference reduction device.

EMPLOYMENT BACKGROUND continued:

1968-1970

President, National Electronic Laboratories
Founder of electronic company engaging in research ans development of solid state devices
The company merged with KMC Semi-conductor Corporation in 1970..

Consultant for Engleman Microwave and KMC Semiconductor Corp.

1959-1968

Group Leader, RCA Communications
Responsible for a group of engineers engaged in research and development contracts in microwave communications. various solid state devices, system engineering, signals in noise, laser, super conductors and interference reduction devices.

1957-1959

Engineer, United States Army Research Laboratories
Developed low noise parametric amplifiers, anti-jamming techniques, millimeter wave radar and target identification radar.

TECHNICAL BACKGROUND:

1. Technical Leader of Research and Development:
   a) Interference reduction technology
   b) Anti-Jamming concepts
   c) Super conductors
   d) Parametric amplifiers
   e) High level convertors
   f) High "Q" filters
   g) Linear receivers
   h) Major communications system designs
   i) Solid state devices
   j) Solid state multipliers and oscillators
   k) sub systems for governmental applications
   l) Lasar modulation television

2. Low noise amplifier advisor to Dynsoar, Relay Satellite, and Lunar Excursion Radar Module

TECHNICAL BACKGROUND continued:

3. Consultant to U.S. Government on Radar Target Identification Techniques

4. Developed the first published parametric amplifiers with voltage gain bandwidth products as large as 1300 at S-band and tunable parametric amplifiers with noise figures of 1.0 dB

5. Developed first published high level parametric upconverter theory and device

6. Co-developed filter concepts which result in unloaded "Q" at 100,000 at room temps

7. Co-developed interference reduction techniques which improve receiver intermodulation distortion performance by 50 dB.

8. Developed linear voltage tuning, broadband high power and high efficiency varactor multipliers for use throughout the microwave region

9. Developed 130 dB dynamic range (-3 dB compression and 1 MHz bandwidth) frequency converters

10. Developed superconducting "X" band filter and amplifiers

11. Designed cellular Television system for commercial use

12. Co-developed critical Patriot Missile module (thousands used per receiver)

13. Expert witness on radar in court for the states of New Jersey and Massachusetts

14. Co-designed TRC-97

15. Program leader for numerous RCA internal research and development projects and government research contracts

AWARDS:

Nominated by RCA for Outstanding Young Engineer in America given by Eta Kappa Nu, National Engineering Honorary Society, 1966

U.S. Government Sustained Superior Performance Award, 1959

Team Engineering Award, RCA

Zero Defects Award, RCA

OTHER:

Chairman, Monolithic Circuits Sessions, MTT's Symposium, 1988

Lecturer, Satellite Communications, Northeastern University, 1986

Guest Lecturer on superconductors, National Science Foundation, University of Colorado, 1965

Guest Lecturer on noise and intermodulation distortion, University of Pennsylvania, 1964-65

Guest Lecturer on low noise technique at Stanford University, Georgia Institute of Technology and Pratt Institute of Technology

Who's Who in the East

Member, Board of Directors of several communications and microwave companies

Guest Lecturer, Communications Systems

PATENTS ISSUED:

Superregenerative Reactance Amplified Number 3,045,115 United States

Variable Frequency Oscillator Number 3,102,978 United States

Low Power Multi-Function Cellular Television System Number 4,747,160 United States and Foreign

PUBLICATIONS AND PRESENTATIONS:

1. Bossard, B. "Superregenerative Reactance Amplifier", Proc. IRE Volume 47, PP 1269-1271 July 1959

2. Bossard, Frost, Fishbein, "X-Brand Superregenerative Paramp", Pro.IRE, July 1960

3. Pettai, Bossard, Weisbaum, "Single Diode Parametric Upconvertor with Large Gd in Bandwidth Product", Proc. IRE, Volume 48, July 1960

4. Bossard, Pettai, "Broad Parametric Amplifiers by Simple Experimental Techniques", Proc. IRE, Volume 50, March 1961

5. Perlman, Bossard, :Efficient High Level Parametric Frequency Convertors", Proc. IEEE, Volume 51, February 1963

6. Bossard, Pettai, "Broadband Parametric Amplifiers", PGMTT Symposium, Bolder, Colorado, 1962

7. Bossard, Pettai, "Parametric Amplifiers", AIEE Convention (Invited Paper) 1962

8. Bossard, Kurzrok, "Comments on Broadband Parametric Amplifiers", Proc. IRE, Volume 50, October 1962

9. Bossard, "Low Noise Microwave Amplifiers", RCA Engineer, 1963

10. Bossard, Perlman, "Tunable Solid State Microwave Power Source", SWITEGO, 1963

11. Perlman, Bossard, "Efficient High Level Parametric Frequency Converters", Part III IEEE National Convention Record, 1963

12. Bossard, Mehlman, Newton, "One Watt Tunable Solid State Power Source for the 4.4 to 5.0 GHz Communications Band", East Coast Navigational Electronics Conference, 1963

13. Pan, Bossard, Burns, Chang, "Systems Concepts of Microwave Communications", NEREM (Invited Paper) 1964

PUBLICATIONS AND PRESENTATIONS continued:

14. Bossard, Torrione, Yuan, "Theory and Improvement of Intermodulation Distortion in Mixers", Tri Service Electromagnetic Compatibility Conference, 1964

15. Pan, Bossard, Yuan, Becker, Torrione, "Receiver Distortions and Reductions", University of Pennsylvania, Summer Lecture Series, 1965

16. Pan, Bossard, Yuan, Becker, Torrione, "Systems Concepts of Radio Interference", University of Pennsylvania, Summer Lecture Series, 1964

17. Bossard, "Communications Applications of Cryogenic Techniques", National Science Foundation, University of Colorado, Summer Lecture Series, 1965

18. Perlow, Bossard, "High "Q" Filter Using Feed Forward Techniques", SWIEECO, Dallas, Texas, 1966

19. Perlow, Bossard, "Effective Receiver Dynamic Range Enhancement", Frequency 1966

20. Perlow, Torrione, Bossard, "Balloon Communication System", RCA Engineer, 1966

21. Bossard, "Effective Receiver Dynamic Range Enhancement", Frequency, 1966

22. Bossard, "Single Frequency Radar Concept", Pratt (Invited Lecture Series) 1965

23. Guest of Honor, Pratt University ETA Kappa Nu and Tsu Beta Pi, Graduation 1965

24. Bossard, Markard, Levine, "Co-Channel Intermodulation and Cross Modulation Reduction Circuit", Proc. IEEE, December 1967

25. Bossard, Communication Systems, Northeastern University, Lecture Series, 1986

26. Bossard, "Microwave Solid State Devices", Boston Chapter, PGMTT, Invited Speaker, April, 1970

27. Perlow, Bossard, " Microwave Transistor Specifications", Microwaves, July, 1970

PUBLICATOINS AND PRESENTATIONS continued:

28. Bossard, "Emerging Technologies" Tela-Stratagies, Guest Speaker, Washington, DC December 1991

29. Bossard, Emerging Technology, SCTE, New Orleans, LA, Guest Speaker, Jan. 7, 1993

30. Bossard, Mercer College, Guest Speaker, March 29, 1993

31. Bossard, Virginia Military Institute, Guest Speaker, April 16, 1993

32. Bossard, Optical Fiber Conference, Phoenix, AZ, Guest Speaker, March 11, 1993

33. Bossard, Satellite and Terrestrial Communications, Societyof Satellite Professionals, New York, NY, Guest Speaker, March 31, 1993

34. Bossard, Wireless Communications, Guest Speaker, Washington, DC April 1,1993

35. Bossard, Fordham University Media Club, Guest Speaker, April, 1993

36. Bossard, Milimeter Wave Communications, Canadian Televison Assoc., Toronto, Canada May 12, 1993

37. Bossard, Conference on Vehicular Technology, Guest Speaker, May 18, 1993

38. Bossard, Cable Television Lab, Brickenridge, Colorado, Guest Speaker, July 27, 1993

39. Bossard, Wireless Local Loop Comex Conference, London, England, Guest Speaker, October 1993

RESUME

Roger L. Freeman

P.O. Box 259
Sudbury, MA 01776

Tel: 508-443-6949

OBJECTIVE: Technically challenging short and medium-term positions as an independent telecommunication consultant.

EXPERIENCE SUMMARY

Over 25 years experience in complex telecommunication system design and operation. Engineered and managed:

- digital telephone networks - data/integrated networks
- digital switching and transmission - routing and signaling
- telecommunications planning - outside/inside plant
- transmission techniques include:
  - LOS microwave
  - satellite systems
  - fiber optics
  - wire-pair
  - coaxial cable
  - troposcatter
  - HF
  - meteor burst
  - VHF/UHF mobile

International experience:

- Europe and Hispanic America
- International agencies such as CCITT/CCIR/ITU
- InterAmerican Development Bank - PTTs

Secret clearance, previously top secret.

SPECIFIC BACKGROUND

1/92 to Present: Independent consultant in telecommunications. Various clients. Specializing in telecommunication systems (transmission and switching) and data networks; survivability issues; new business development.

7/78 to 12/91: Raytheon Company, Communication Systems Directorate, Marlborough, MA.
Principal Engineer, Advanced System Planning. Responsible for new business development for advanced military communication systems.

- Adapted advanced commercial telecommunication practice to the military environment.
- Prepared corporate position papers on technical issues such as:
  - commercial satellite communications for military application
  - BISDN/ATM in the tactical environment
  - OC-1 and OC-3 over millimeter wave radio
  - MBC system experiments for the U.S. Army
- Advised other Raytheon divisions/directorates on commercial telecommunication practice such as Nexrad and Ramp.

4/70 to 7/78: ITT Laboratories, Spain (Madrid)
Staff consultant, telecommunication planning. Advised on transmission and signaling planning.

- Prepared/published ITT's "Telecommunication Planning Guides."

- Managed planning projects in Hispanic America and Europe.
- Managed ITT Marine (technical) for three years - saw 50% increase in GOR

PRIOR EXPERIENCE

Page Communications Engineers, Washington, D.C. Staff engineer for Hispanic American programs.

International Telecommunication Union (Geneva) Regional Planning Expert for northern South America based in Quito, Ecuador.

ITT Communication Systems - member of technical staff, military communication system design.

EDUCATION: Bachelors and Masters degrees, New York University.

OTHER BACKGROUND INFORMATION

Memberships:

- Senior member, IEEE and candidate for fellow.

Special activities:

- Guest editor, IEEE Communications magazine, special issue on Desert Storm communications (Jan. '92).
- Session organizer/chairman, MILCOM '89 and '90.

Languages:

- Fluent in Spanish, particularly technical Spanish.

Publications:

- Authored and published over 15 articles in international technical journals dealing with various disciplines of telecommunications.
- Authored and published four related textbooks:
  - "Reference Manual for Telecommunication Engineering," Wiley NY 1985
  - "Radio System Design for Telecommunications," Wiley NY 1987
  - "Telecommunication System Engineering," 2nd edition, Wiley NY 1989
  - "Telecommunication Transmission Handbook," 3rd edition, Wiley NY 1991.

Prepared seminars and taught:

- "Telecommunication Transmission Systems," taught in Spanish, Quito Polytechnic University 1967-1969.
- "Radio System Design," "Telecommunication System Engineering" and "Telecommunication Transmission Techniques" at the University of Wisconsin - Madison.

Teacher-of-the-year, Northeastern University, 1987.